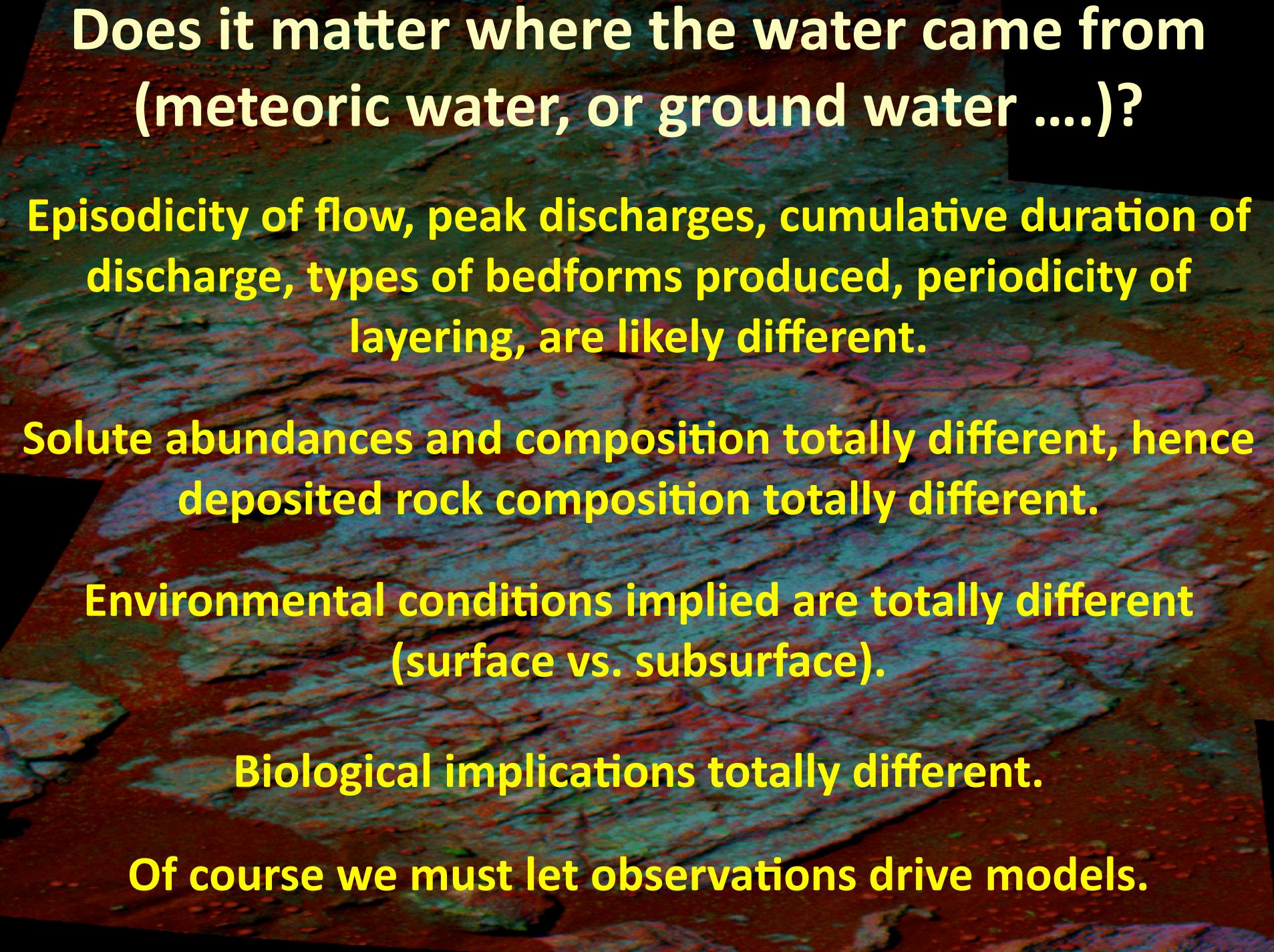
A wide-angle, color-enhanced photograph of a geological outcrop on the surface of Mars. The image shows distinct horizontal sedimentary rock layers. Some layers are light blue or cyan, while others are reddish-brown, suggesting different mineral compositions or exposure to aqueous environments. The terrain is rugged, with various sized boulders and rocky debris scattered across the surface. The lighting suggests a low-angle sun, casting long shadows and highlighting the three-dimensional nature of the rock stacks.

Potential to establish aqueous chemical processes and chemical stratigraphy of the MSL landing sites with aid of Fuzzy C Means analysis of multispectral imaging and use of FREZCHEM

Jeff Kargel, Roberto Furfaro, Giles Marion, and Alexis Rodriguez



# Does it matter where the water came from (meteoric water, or ground water ....)?

Episodicity of flow, peak discharges, cumulative duration of discharge, types of bedforms produced, periodicity of layering, are likely different.

Solute abundances and composition totally different, hence deposited rock composition totally different.

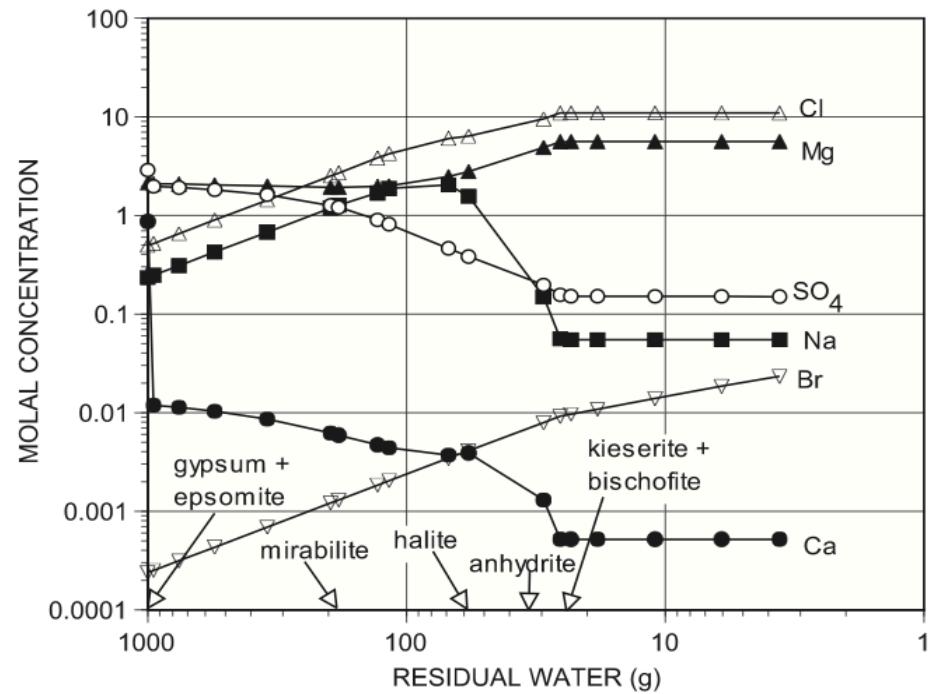
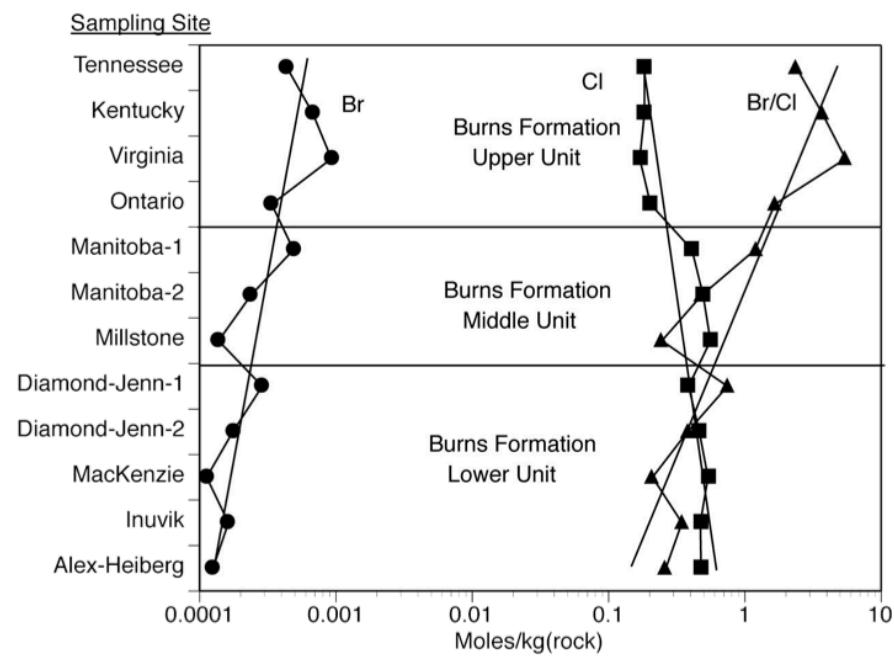
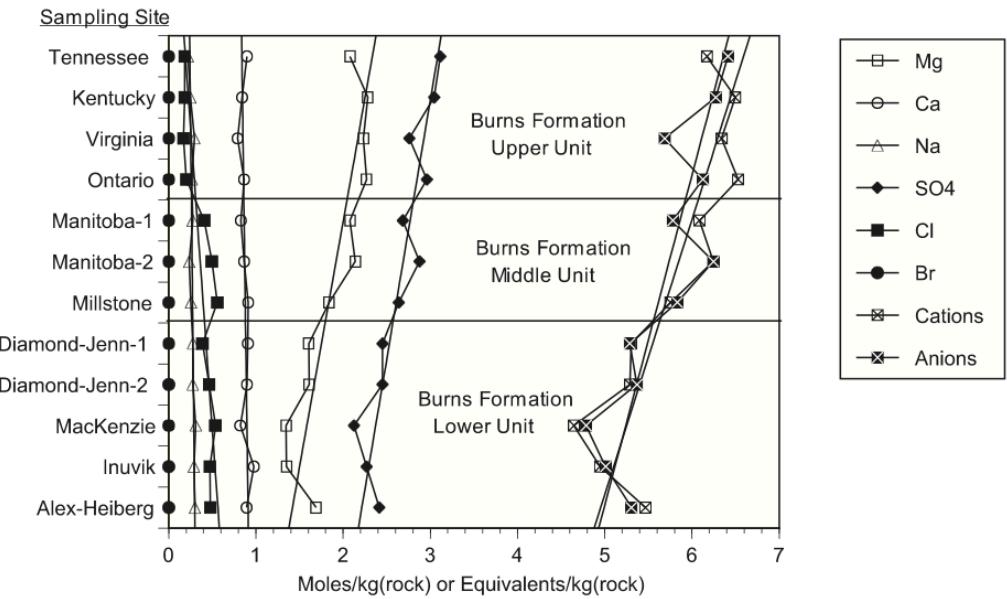
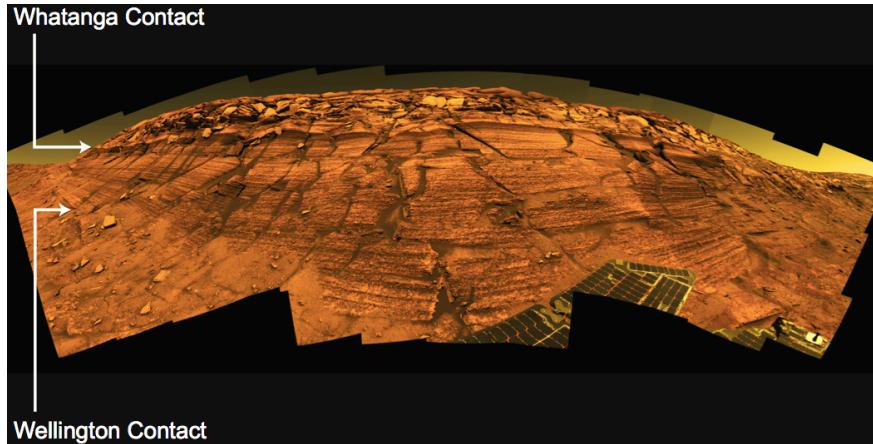
Environmental conditions implied are totally different (surface vs. subsurface).

Biological implications totally different.

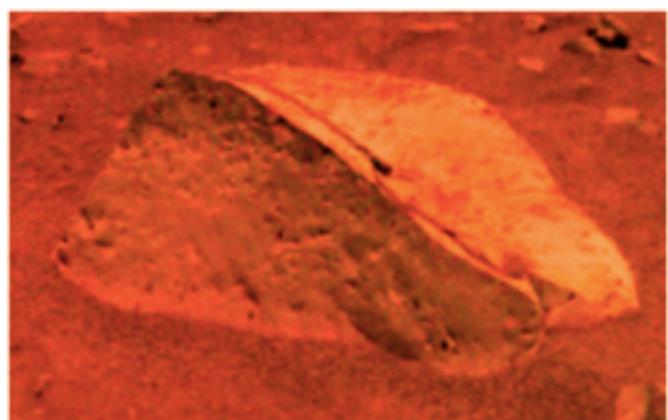
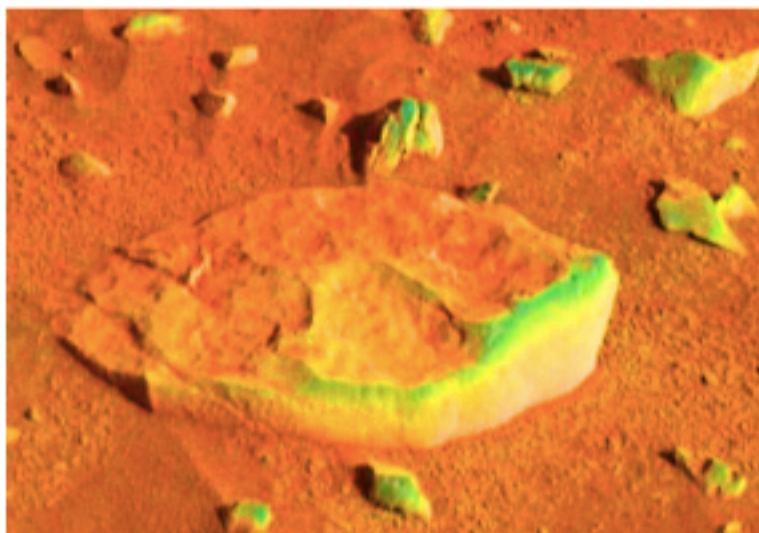
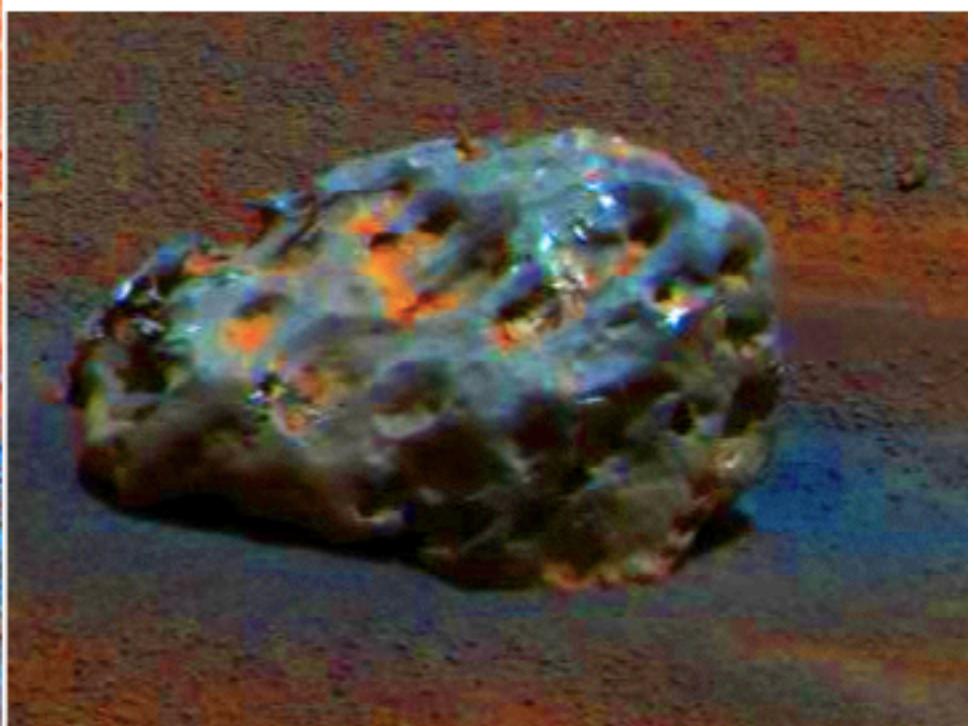
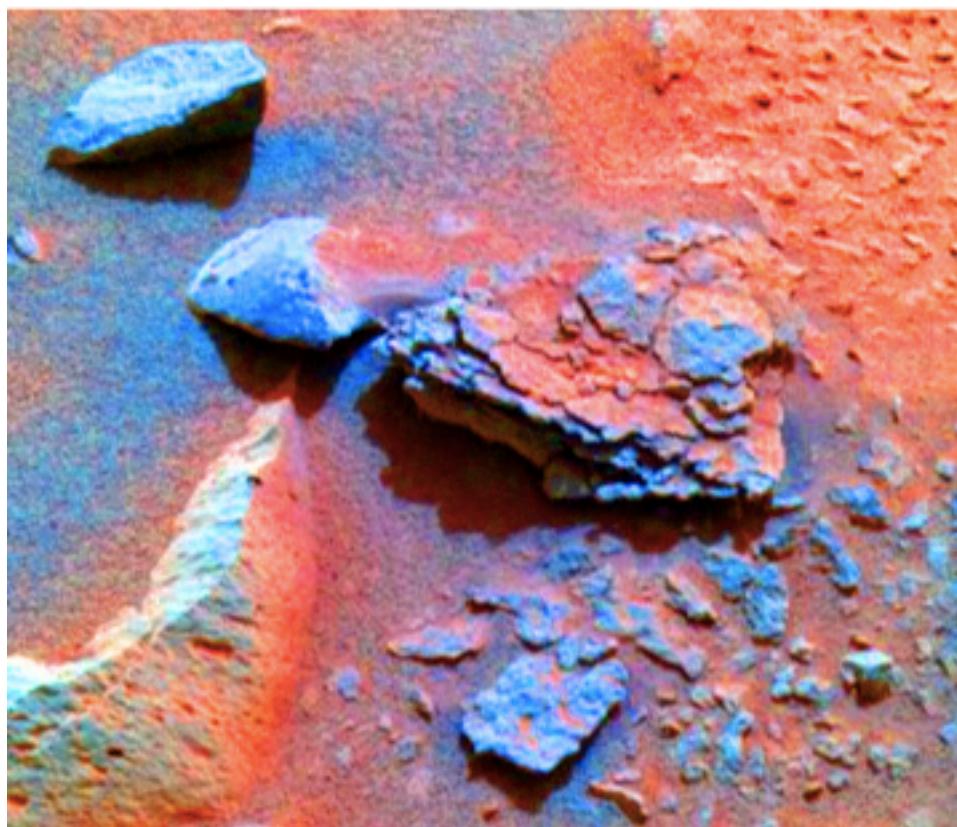
Of course we must let observations drive models.

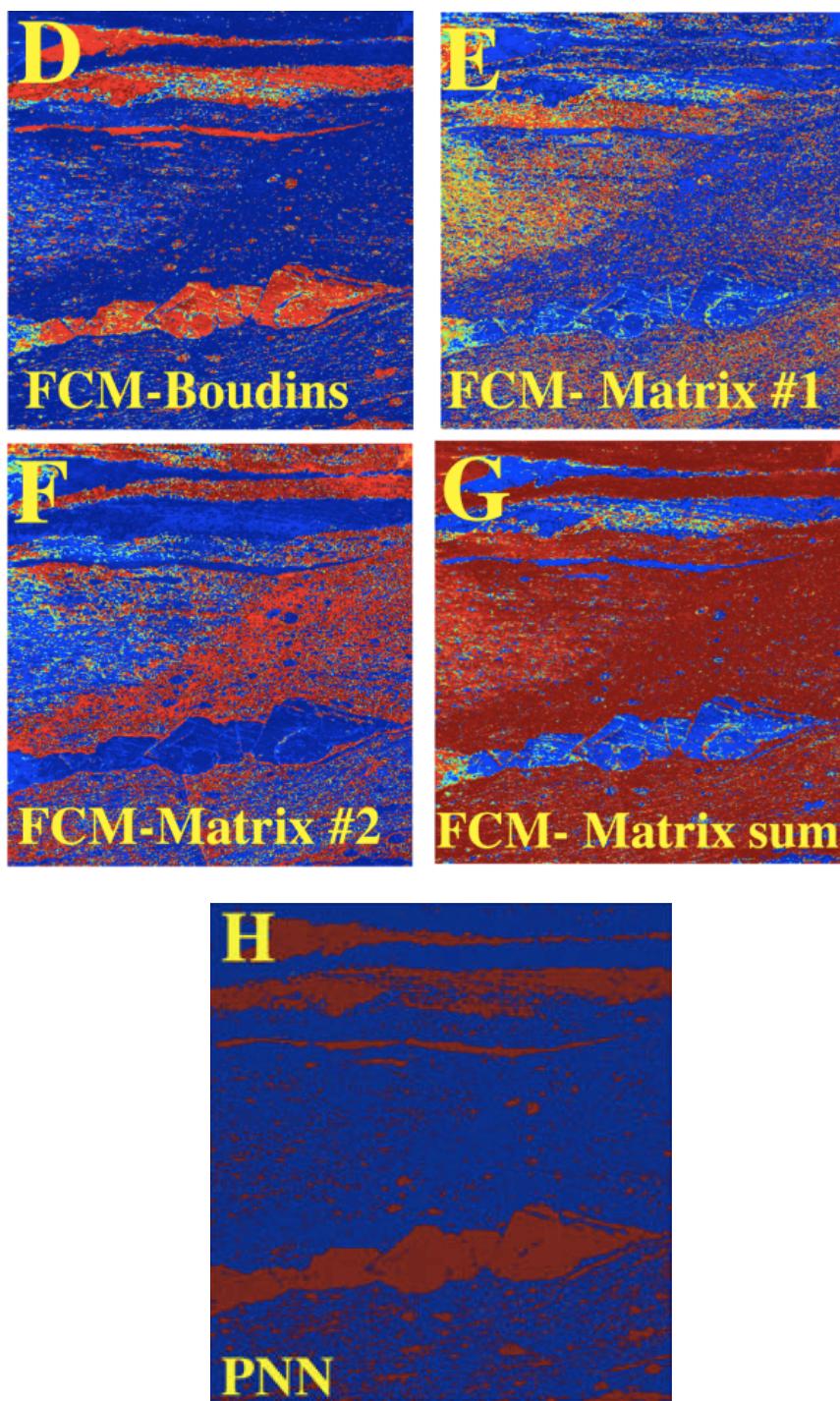
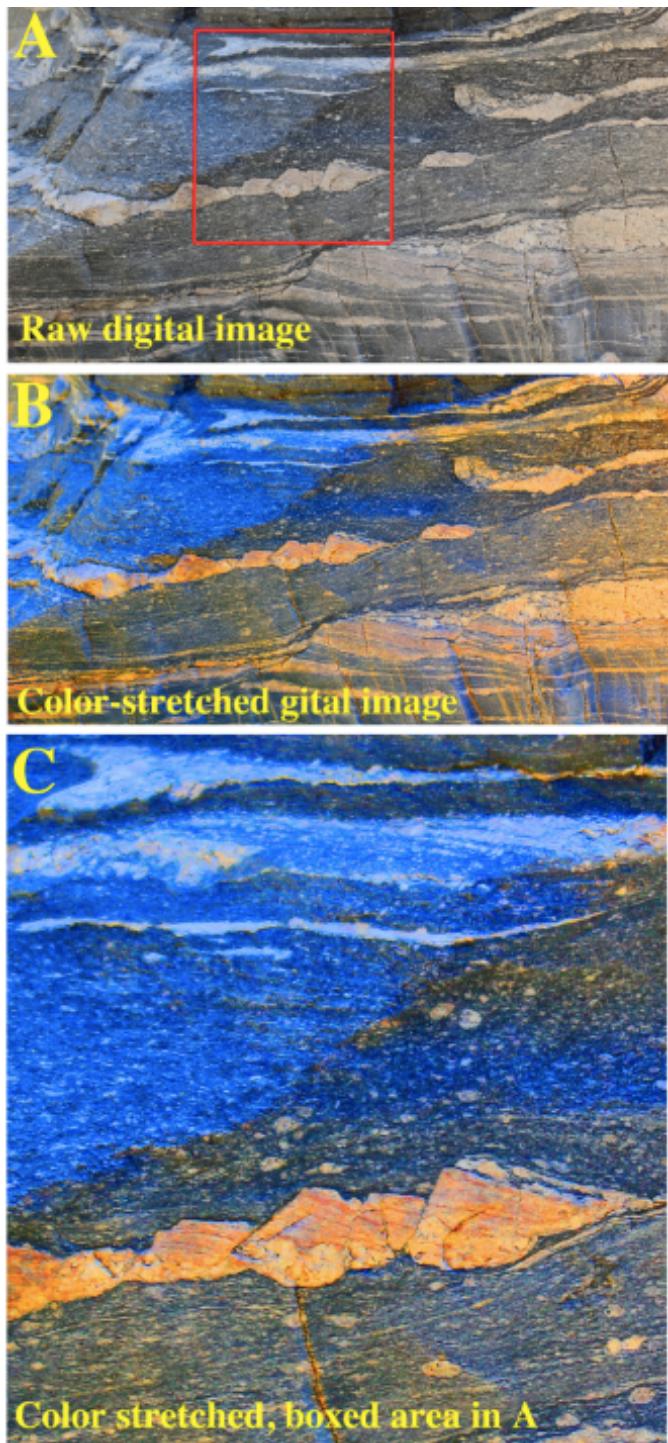
# Burns formation: Evaporation of saline groundwater

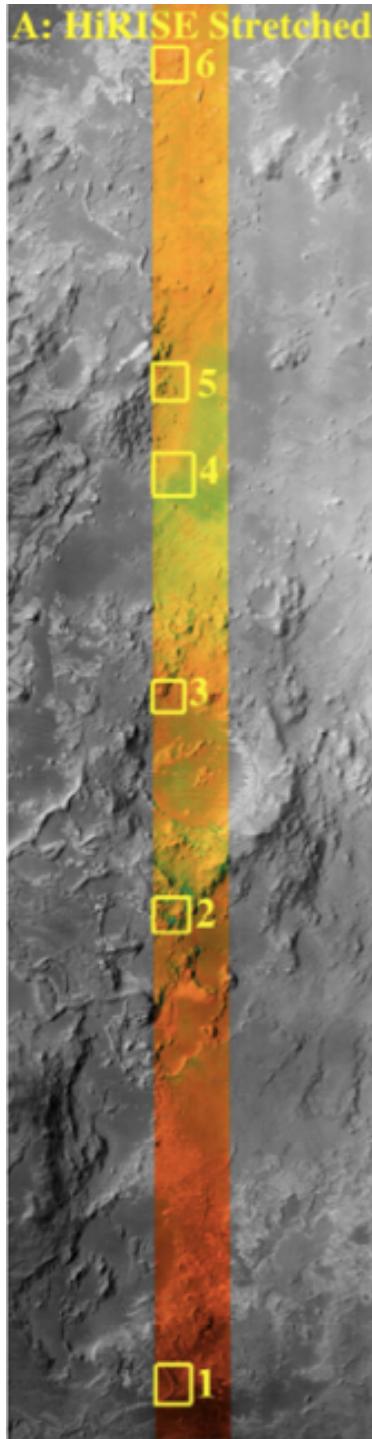
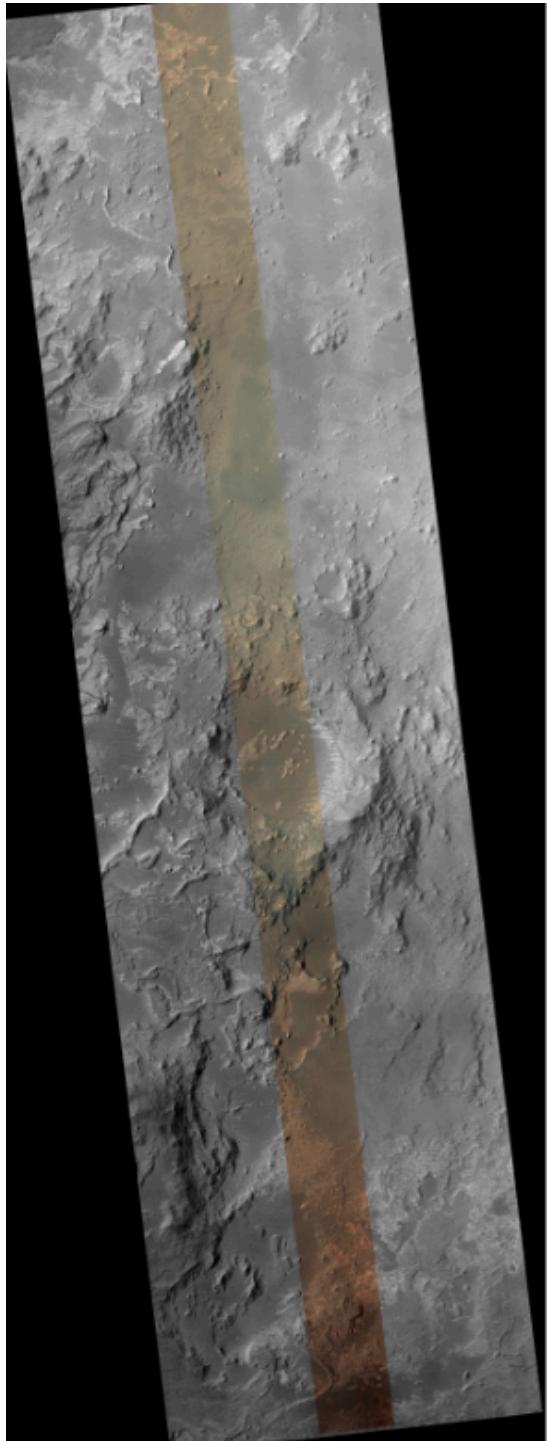
From Marion, Catling & Kargel 2008,  
Geochimica et Cosmochimica Acta









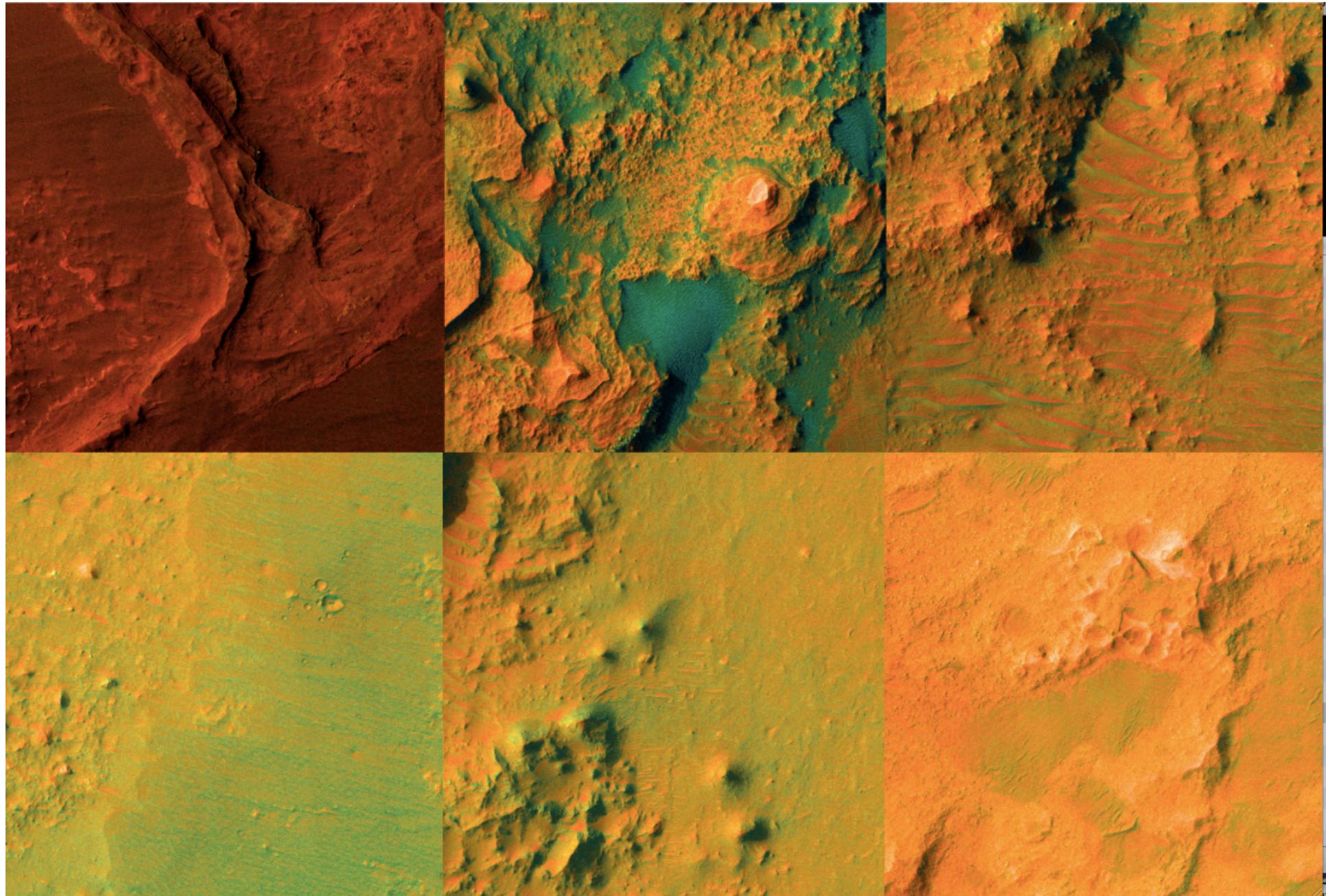


HiRISE image  
of part of  
Eberswalde  
Delta

6 cropped subscenes, 4 x 4 pixel summed



6 cropped subscenes, color saturated and contrast stretched

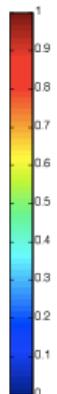
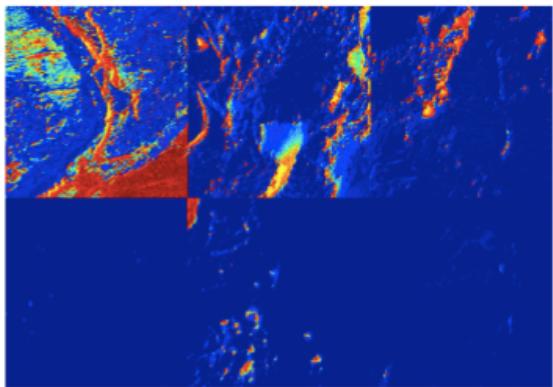




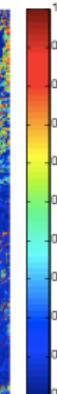
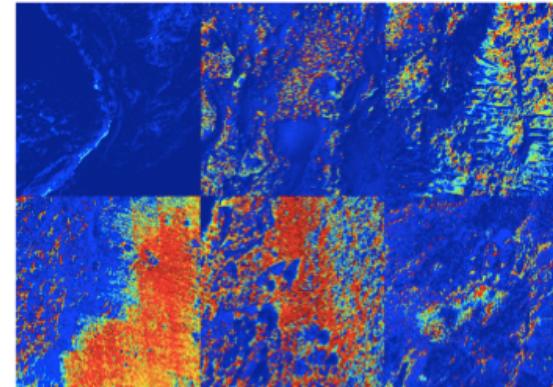
6 cropped subscenes

FCM 6 classes clustering

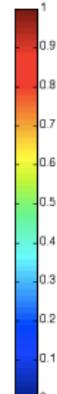
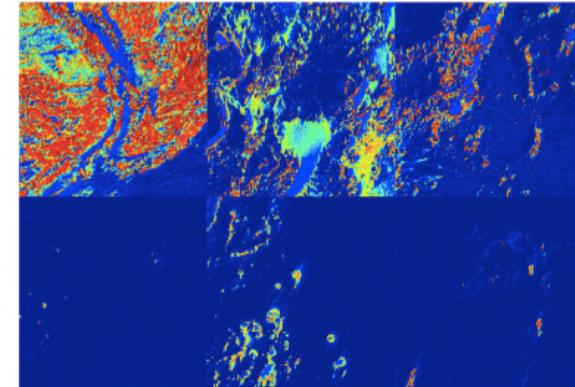
Class 1



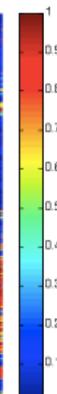
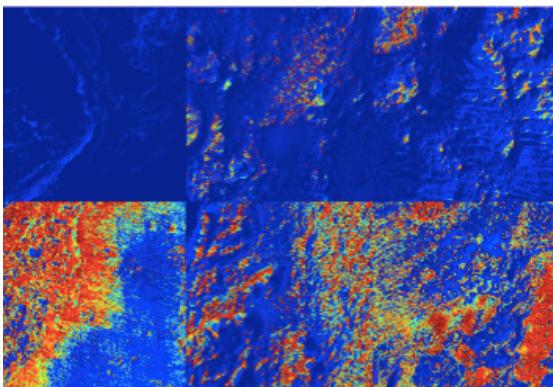
Class 2



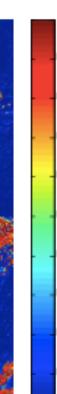
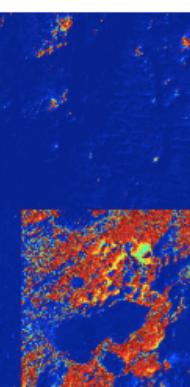
Class 5



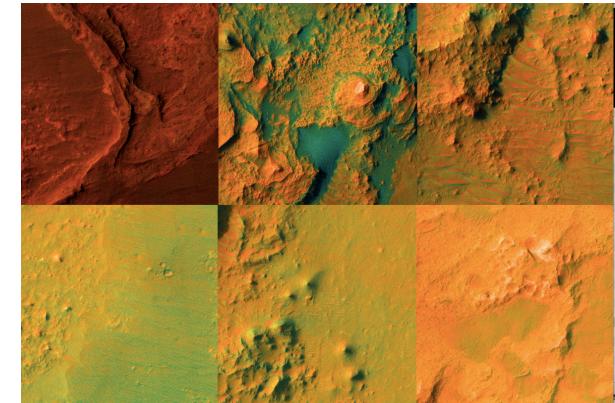
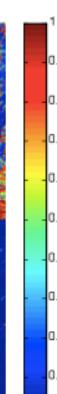
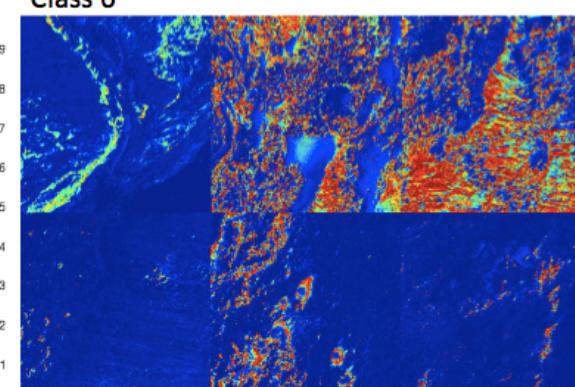
Class 3



Class 4



Class 6



Color saturation and contrast stretch